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**TICKETING SYSTEM OPERABLE BY MOBILE COMMUNICATORS**

Abstract:

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(A2) A ticketing system, comprising: a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of transporters which provide for transport of users between access points and each include an on-board transport communicator for communicating locally with any enabled mobile communicators of registered users on board the respective transporter and a control center for logging travel of users on the at least one transport network through communication established between enabled mobile communicators and the transport communicators of transporters.

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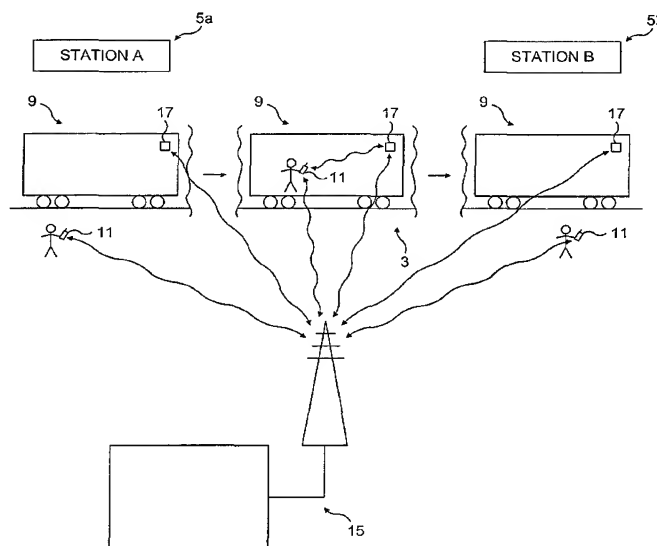
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- (71) Applicant (for all designated States except US): **SITRA LTD** [GB/GB]; Street Cottage, Heyshott, Midhurst, West Sussex, GU29 0DP (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **ISAAC, Stephen, John** [GB/GB]; Street Cottage, Heyshott, Midhurst, West Sussex, GU29 0DP (GB).
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(54) Title: TICKETING SYSTEM OPERABLE BY MOBILE COMMUNICATORS



(57) Abstract: A ticketing system, comprising: a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel; at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of transporters which provide for transport of users between access points and each include an on-board transport communicator for communicating locally with any enabled mobile communicators of registered users on board the respective transporter; and a control center for logging travel of users on the at least one transport network through communication established between enabled mobile communicators and the transport communicators of transporters.



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**TICKETING SYSTEM OPERABLE BY MOBILE COMMUNICATORS**

The present invention relates to a ticketing system for and a method of issuing tickets, in particular a paperless ticketing system for and a method of issuing travel tickets, where utilizing a mobile communicator, such as a mobile telephone.

Issuing tickets, such as travel tickets, and checking the validity of those tickets is a significant overhead. Typically, in relation to travel tickets, paper tickets are issued and inspected by a human operative.

It is an aim of the present invention to provide for automatic ticketing, in one embodiment without any human intervention.

In one aspect the present invention provides a ticketing system, comprising: a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel; at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of transporters which provide for transport of users between access points and each include an on-board transport communicator for communicating locally with any enabled mobile communicators of registered users on board the respective transporter; and a control center for logging travel of users on the at least one transport network through communication established between enabled mobile communicators and the transport communicators of transporters.

In one embodiment the control center is configured to determine the access points at which a user enters and exits the at least one transport network from a location of the mobile communicator registered to the user.

In one embodiment at least ones of the access points include at least one access unit for determining access to the respective access point, and each access unit includes an access communicator for communicating locally with

an enabled mobile communicator when located thereat to determine access through the respective access unit.

Preferably, the control center is configured to determine the access points at which a user enters and exits the at least one transport network from a location of the access units through which the user enters and exits the at least one transport network.

Preferably, the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.

Preferably, the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.

In one embodiment the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.

Preferably, the open ticket is valid for a predetermined period.

In another embodiment the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.

In another aspect the present invention provides a ticketing system, comprising: a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel; and at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of transporters which provide for transport of users between access points, wherein at least ones of the access points include at least one access unit for determining access to the respective access point, and each access unit includes an access communicator for communicating locally with an enabled

mobile communicator when located thereat to determine access through the respective access unit.

Preferably, the system further comprises: a control center for logging travel of users on the at least one transport network through communication between enabled mobile communicators and the access communicators of access units.

Preferably, the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.

Preferably, the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.

In one embodiment the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.

Preferably, the open ticket is valid for a predetermined period.

In another embodiment the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.

In one embodiment the access units comprise access gates for controlling access to the respective access points, and the access communicators are configured to communicate locally with enabled mobile communicators when located thereat to allow access through the respective access units.

In a further aspect the present invention provides a ticketing system, comprising: a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel; and at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of

transporters which provide for transport of users between access points, wherein the transporters each include at least one access unit for determining access at the respective access point, and each access unit includes an access communicator for communicating locally with an enabled mobile communicator when located thereat to determine access through the respective access unit.

Preferably, the system further comprises: a control center for logging travel of users on the at least one transport network through communication between enabled mobile communicators and the access communicators of access units.

Preferably, the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.

Preferably, the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.

In one embodiment the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.

Preferably, the open ticket is valid for a predetermined period.

In another embodiment the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.

In one embodiment the access units are configured to control access, and the access communicators are configured to communicate locally with enabled mobile communicators when located thereat to allow access through the respective access units.

In a yet further aspect the present invention provides a ticketing system, comprising: a plurality of mobile communicators, each registered to a user

of the ticketing system and being operable to obtain a ticket to enable travel; at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, wherein the access points include at least one access unit for determining access to the respective access point, and each access unit includes an access communicator for communicating locally with an enabled mobile communicator when located thereat to determine access through the respective access unit; and a control center for logging travel of users on the at least one transport network through communication between enabled mobile communicators and the access communicators of access units.

In one embodiment the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.

Preferably, the open ticket is valid for a predetermined period.

In another embodiment the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.

Preferably, the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.

Preferably, the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.

In one embodiment the access units are configured to control access, and the access communicators are configured to communicate locally with enabled mobile communicators when located thereat to allow access through the respective access units.

In a still further aspect the present invention provides a ticketing system, comprising: a plurality of mobile communicators, each registered to a user



of the ticketing system and being operable to obtain a ticket to enable travel on at least one transport network; and a control center in operative communication with the mobile communicators in enabling a user to obtain a ticket through a request made at a mobile communicator registered thereto.

Preferably, the system further comprises: at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network.

In one embodiment at least ones of the access points include at least one access gate, and the ticket provides an access code for manually accessing an access unit.

In one embodiment the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.

Preferably, the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.

In a yet further aspect the present invention provides a method of billing users for tickets, comprising the step of billing each daily ticket up to and until a season ticket rate for a predeterminable period is exceeded, and providing free travel thereafter during that period.

Preferably, the season ticket rate is that for one journey route.

Preferably, the period is one of a week, month or year.

Preferably, the method further comprises the step of billing each daily ticket up to and until a season ticket rate for a further predeterminable period is exceeded, and providing free travel thereafter during that further period.

More preferably, the first period is a week, and the further period is one of a month or a year.

More preferably, the method further comprises the step of billing each daily ticket up to and until a season ticket rate for a yet further predeterminable period is exceeded, and providing free travel thereafter during that yet further period.

More preferably, the first period is a week, the further period is one of a month, and the yet further period is of a year.

In a still further aspect the present invention provides a method of billing for tickets, comprising the step of billing each daily ticket for a predeterminable period, and, where the bill exceeds a season ticket rate for the period, subsequently making a refund.

Preferably, the season ticket rate is that for one journey route.

Preferably, the period is one of a week, month or year.

In still yet another aspect the present invention provides a method of billing users for tickets, comprising the steps of, for any user, billing for provided tickets at a current rate, logging a ticket billing history for the billed tickets, and reviewing the ticket billing history to determine if ones of the provided tickets could have been billed at a lower rate by providing one or more alternative tickets, and refunding a difference in the rates of the ones of the provided tickets and the one or more alternative tickets.

In a still yet further aspect the present invention provides a method of billing users for tickets, comprising the steps of, for any user, billing for provided tickets at a current rate, logging a ticket billing history for the billed tickets, and reviewing the ticket billing history to determine if, for any journey route, ones of the provided tickets would be encompassed by a season ticket of lower rate, and, where a season ticket of lower rate is

determined, providing free future travel for a duration of that season ticket on the journey route.

Preferred embodiments of the present invention will now be described hereinbelow by way of example only with reference to the accompanying drawings, in which:

Figure 1 illustrates a ticketing system in accordance with a first embodiment of the present invention;

Figure 2 illustrates a ticketing system in accordance with a second embodiment of the present invention;

Figure 3 illustrates a ticketing system in accordance with a third embodiment of the present invention;

Figure 4 illustrates a ticketing system in accordance with a fourth embodiment of the present invention;

Figure 5 illustrates a ticketing system in accordance with a fifth embodiment of the present invention; and

Figure 6 illustrates a ticketing system in accordance with a sixth embodiment of the present invention.

Figure 1 illustrates a ticketing system in accordance with a first embodiment of the present invention.

The ticketing system comprises a transport network 3, in this embodiment a railway network, here an overground railway network, which comprises a plurality of access points 5a, 5b, in this embodiment stations, at which the transport network 3 can be accessed to allow users to enter or exit the transport network 3, and a plurality of transporters 9, in this embodiment

trains, which provide for transport of users between the access points 5a, 5b, a plurality of registered mobile communicators 11 which are assigned to registered users of the ticketing system, and a control center 15 for authenticating any registered mobile communicators 11 on board transporters 9 and billing for transport provided. In this embodiment the transport network 3 comprises a railway network, but in other embodiments the transport network 3 could comprise any network which has a plurality of access points 5a, 5b which allow users to enter and exit the transport network 3, such as a bus network, where the access points 5a, 5b are bus stops, either at the roadside or at bus depots, and in embodiments at interchange nodes within or between the transport network 3.

The transporters 9 each include a transport communicator 17 for communicating locally with any mobile communicators 11 of registered users on board the respective transporter 9 and the control center 15, as will be described in more detail hereinbelow.

The mobile communicators 11, in this embodiment mobile telephones, comprise a first transmitter/receiver unit for locally communicating with the transport communicator 17 of a transporter 9 when on board the transporter 9, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 15. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 3.

The mobile communicators 11 provide for determination of the position thereof, in this embodiment by one of satellite positioning, such as GPS, radio positioning, such as triangulation, or cell identification.

The mobile communicators 11 are each registered to a user, with the details held for each registered user including the name, address, security information, such as a memorable address or date, bank details to allow for

direct debiting or crediting of charges, personal preferences, and demographic details.

In this embodiment each mobile communicator 11 is activated for use on the ticketing system by use of an authentication mechanism, such as by inputting an operating code, for example, a personal identification (PIN) code.

The transport communicators 17 on board the transporters 9 each include a first transmitter/receiver unit for locally communicating with the mobile communicators 11 of any registered users on board the respective transporter 9, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 15. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 3.

In this embodiment the mobile communicators 11 and the transport communicators 17 are configured to communicate with the control center 15 over the same mobile communications network, though different mobile communications networks could be utilized.

When requiring to travel, a user enables his/her mobile communicator 11 by entering his/her operating code, and obtains an open ticket by selecting the "Open Ticket" option on his/her mobile communicator 11. On selecting this option, the mobile communicator 11 transmits a ticket request signal to the control center 15. On receiving a ticket request signal, the control center 15 authenticates the user, opens a ticket log, and transmits a ticket request acknowledgement signal to the mobile communicator 11 to confirm the establishment of a ticket log.

Having obtained an open ticket, the user then boards a transporter 9, in this embodiment at a first access point 5a, and his/her mobile communicator 11

automatically associates with the transport communicator 17 on board the transporter 9. On associating with the transport communicator 17, the mobile communicator 11 issues a distinctive tone to provide the user with confirmation of the association, and the transport communicator 17 transmits a transport signal to the mobile communicator 11. The transport signal includes transport information which is presented to the user on the mobile communicator 11, which transport information includes confirmation as to the transport provider, and the fare kind, typically the class of travel where the transporter 9 provides more than one class of travel.

Following association of the mobile communicator 11 and the transport communicator 17, the transport communicator 17 transmits a journey commencement signal to the control center 15, which journey commencement signal includes transport information required for the purposes of ticketing, such as the operator where a multi-operator system, and the fare kind, where the transport provider provides more than one kind of fare. On receiving a journey commencement signal, the control center 15 updates the ticket log and transmits a journey commencement acknowledgement signal to the mobile communicator 11 to confirm the commencement of the journey, with the starting point of the journey, as dictated by the location of the access point 5a, being determined from the location of the transport communicator 17.

In an alternative embodiment the mobile communicator 11 could transmit the journey commencement signal to the control center 15.

While the user remains on the transporter 9, the mobile communicator 11 will remain associated to the transport communicator 17.

When the user alights from the transporter 9 at another access point 5b in the transport network 3, the association between the mobile communicator 11 and the transport communicator 17 will be broken. Following termination of the association, and in this embodiment the physical separation of the transport communicator 17 from the mobile communicator 11 by a

predetermined distance as determined from the derived positions thereof, the mobile communicator 11 transmits a journey termination signal to the control center 15.

On receiving the journey termination signal, the control center 15 determines the access point 5b at which the user has alighted from the transporter 9, as derived from the location of the mobile communicator 11, closes the ticket log for that journey, determines the fare payable, and transmits a journey termination confirmation signal to the mobile communicator 11 to confirm termination of the journey. In this embodiment the journey termination confirmation signal includes the cost of the fare for the journey, which fare cost is presented to the user on his/her mobile communicator 11. Using the ticketing system, the fare structure can be sophisticated, as many factors, such as time of day, promotions, previous travel history, and user kind, for example, student or old-age pensioner (OAP) where entitled to discounts, can be taken into account without any burden on the part of the transport provider.

Following receipt of a journey termination confirmation signal, the user can then manually close down the open ticket by selecting the "Open Ticket - Terminate" option on his/her mobile communicator 11. Where the open ticket is not closed down and remains active, the user can travel further on the transport network 3 without requiring any further action on the part of the user. In this embodiment, an open ticket can remain active over an entire billing period, and is automatically closed down by the control center 15 at the end of the billing period through transmission of an open ticket termination signal to the mobile communicator 11. Where the mobile communicator 11 is still associated to the transport communicator 17 of a transporter 9, that is, the user is still on a journey, at the end of the billing period, the billing period is extended until termination of the journey, this being when the mobile communicator 11 transmits a journey termination signal to the control center 15.

In this embodiment billing is performed at intervals, typically daily, such that all ticket charges incurred during the interval are totalled and billed. In an alternative embodiment billing can be done on completion of each journey. One advantage of billing at intervals is that the journeys undertaken in the interval can be analyzed such as to allow for billing to take advantage of reduced fares, for example, where arising as a result of completing a return journey, as compared to two single journeys, or, where billed daily, on a day rover ticket where ones or all of the journeys are encompassed by such a ticket. With this billing arrangement, the user is provided with a clear incentive to utilize the ticketing system, as the user can be confident that the travel charges will be minimized retrospectively where possible, which could not be achieved by the current practice of purchasing tickets in advance of travel.

In this embodiment the termination of the journey is notified by the mobile communicator 11 transmitting the journey completion signal to the control center 15. In requiring notification by the mobile communicator 11, the possibility of a user defrauding the ticketing system by switching off his/her mobile communicator 11 is avoided, as an open ticket log cannot be closed, and an open ticket log at the end of the billing period attracts a fine, typically the full fare to a terminating access point 5 on the transport network 3.

Where the user is transferring onto another leg of a journey, perhaps with a different transport provider, the user does not have to take any further action, as the existing open ticket will remain active, and the above-described ticketing process will be repeated when the user boards another transporter 9.

In this embodiment the user can request journey information by selecting the "Journey History" option on his/her mobile communicator 11, which journey information includes the routes and costs, and, for the current journey, the current cost of the journey.



In one embodiment the mobile communicators 11 are configured such that, when in the "Open Ticket" mode with an active open ticket, the mobile communicator 11 cannot be switched off, at least insofar in relating to the open ticket application, before closing down the open ticket, which can only be achieved following disassociation of the mobile communicator 11 from the transport communicator 17 of a transporter 9, and thus requires the user not to be on board a transporter 9.

As will be appreciated, from the perspective of the users, this ticketing system provides users with an extremely easy means of travelling on a transport network 3 which requires a ticket to travel, as *inter alia* the users do not have to queue to obtain tickets.

As will also be appreciated, from the perspective of the transport providers, this ticketing system provides for much reduced ticketing overheads. Where a transport provider also issues advance-purchase tickets, and inspection of tickets is required, the open ticket provided by this ticketing system can be presented to a user.

Figure 2 illustrates a ticketing system in accordance with a second embodiment of the present invention.

The ticketing system of this embodiment is quite similar to the ticketing system of the above-described first embodiment of the present invention, and thus, in order to avoid unnecessary duplication of description, only the differences will be described in detail.

The ticketing system of this embodiment differs from the ticketing system of the above-described first embodiment in that the access points 5a, 5b of the transport network 3 include access units 19 for providing access thereto or therefrom.

In this embodiment the access units 19 comprise access gates which are configured such as to allow a user to enter an access point 5a, 5b only when

an open ticket has been enabled on his/her mobile communicator 11, and leave an access point 5a, 5b only following the receipt of a journey completion confirmation signal to the control center 15.

In this embodiment the access units 19 each include an access communicator 21 which includes a transmitter/receiver unit for locally communicating with mobile communicators 11. In this embodiment, following receipt of a ticket request acknowledgement signal, a mobile communicator 11 locally transmits an entry signal, such that, as the user approaches an access unit 19, the access unit 19 receives the entry signal and, in response to receipt of the entry signal, opens the access unit 19 to allow the user to enter the access point 5a, 5b. In this embodiment, following receipt of a journey completion confirmation signal, a mobile communicator 11 locally transmits an exit signal, such that, as the user approaches an access unit 19, the access unit 19 receives the exit signal and, in response to receipt of the exit signal, opens the access unit 19 to allow the user to exit the access point 5a, 5b.

In an alternative embodiment the mobile communicators 11 can be configured to display one an entry code following receipt of a ticket request acknowledgement signal or an exit code following receipt of a journey completion confirmation signal, which codes can be checked at access gates 19, either automatically by the provision of vision systems at the access gates 19 or manually by a human operative.

Figure 3 illustrates a ticketing system in accordance with a third embodiment of the present invention.

The ticketing system comprises a transport network 23, in this embodiment a railway network, here an underground railway network, which comprises a plurality of access points 25a, 25b, in this embodiment stations, at which the transport network 23 can be accessed to allow users to enter or exit the transport network 23, and transporters 29, in this embodiment trains, which provide for transport of users between ones of the access points 25a, 25b, a

plurality of mobile communicators 31 which are assigned to registered users of the ticketing system, and a control center 35 for authenticating registered mobile communicators 31 when enabled to the ticketing system, and billing for transport provided.

The access points 25a, 25b of the transport network 23 include access units 39, in this embodiment access gates, for providing access to or from the access points 25a, 25b. In this embodiment the access units 39 each include an access communicator 41 for communicating locally with mobile communicators 31 of registered users when located thereat and the control center 35, as will be described in more detail hereinbelow.

In this embodiment the access units 39 are configured such as to allow a user to enter or leave an access point 25a, 25b only when his/her mobile communicator 31 is transmitting an access signal, as will be described in more detail hereinbelow.

The mobile communicators 31, in this embodiment mobile telephones, comprise a first transmitter/receiver unit for locally communicating with an access communicator 41 of an access unit 39 when the user passes therethrough, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 35. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 23.

The mobile communicators 31 provide for determination of the position thereof, in this embodiment by one of satellite positioning, such as GPS, radio positioning, such as triangulation, or cell identification. In this embodiment the control center 35 periodically logs the position of enabled mobile communicators 31 such as to allow for subsequent review should any dispute arise concerning the journey made by a user and to track route alternatives.

The mobile communicators 31 are each registered to a user, with the details held for each registered user including the name, address, security information, such as a memorable address or date, bank details to allow for direct debiting or crediting of charges, personal preferences, and demographic details.

In this embodiment each mobile communicator 31 is activated for use on the ticketing system by use of an authentication mechanism, such as by inputting an operating code, for example, a personal identification (PIN) code.

The access communicators 41 at the access units 39 each include a first transmitter/receiver unit for locally communicating with the mobile communicators 31 of any registered user when passing through the respective access unit 39, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 35. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 23.

In this embodiment the mobile communicators 31 and the access communicators 41 of the access units 39 are configured to communicate with the control center 35 over the same mobile communications network, though different mobile communications networks could be utilized.

When requiring to travel, a user enables his/her mobile communicator 31 by entering his/her operating code, and obtains an open ticket by selecting the "Open Ticket - Configure" option on his/her mobile communicator 31. On selecting this option, the mobile communicator 31 transmits a ticket request signal to the control center 35. On receiving a ticket request signal, the control center 35 authenticates the user, opens a ticket log, and transmits a

ticket request acknowledgement signal to the mobile communicator 31 to confirm the establishment of a ticket log.

Having obtained an open ticket, and following receipt of a ticket request acknowledgement signal, the mobile communicator 31 locally transmits an access signal, allowing the user to pass through an access unit 39 at an access point 25a, 25b. On passing through an access unit 39 to enter an access point 25a, 25b, in this embodiment one access point 25a, the access communicator 41 of the access unit 39 receives the access signal and, in response to receipt of the access signal, opens the access unit 39 to allow the user to enter the access point 25a.

Following opening of the access unit 39, the access communicator 41 of the access unit 39 transmits a journey commencement signal to the control center 35, which journey commencement signal includes transport information required for the purposes of ticketing. On receiving a journey commencement signal, the control center 35 updates the ticket log and transmits a journey commencement acknowledgement signal to the mobile communicator 31 to confirm the commencement of the journey, with the starting point of the journey being the access point 25a.

In an alternative embodiment the access communicator 41 of the access unit 39 could transmit an access point entry signal to the mobile communicator 31, and, following receipt of the access point entry signal, the mobile communicator 31 could transmit the journey commencement signal to the control center 35.

When the user alights from the transporter 29 at another access point 25b in the transport network 23 and wishes to leave the transport network 23 at the other access point 25b, the user approaches an access unit 39 at the other access point 25b. On passing through the access unit 39 to exit the other access point 25b, the access communicator 41 of the access unit 39 receives the access signal and, in response to receipt of the access signal, transmits a journey termination signal to the control center 35, which

journey termination signal includes a designation of the other access point 25b.

On receiving the journey termination signal, the control center 35 closes the ticket log, determines the fare payable, and transmits a journey termination confirmation signal to the access communicator 41 of the access unit 39 to confirm termination of the journey. In this embodiment the journey termination confirmation signal includes the cost of the fare for the journey. Using the ticketing system, the fare structure can be sophisticated, as many factors, such as time of day, promotions, previous travel history, and user kind, for example, student or old-age pensioner (OAP) where entitled to discounts, can be taken into account without any burden on the part of the transport provider.

On receipt of the journey termination confirmation signal by the access communicator 41 of the access unit 39, the access unit 39 is opened and the access communicator 41 transmits a journey billing signal to the mobile communicator 31, which journey billing signal includes the cost of the fare for the journey, with the fare cost being presented to the user on his/her mobile communicator 31.

Following completion of the journey, the user can then manually close down the open ticket by selecting the "Open Ticket – Terminate" option on his/her mobile communicator 31. Where the open ticket is not closed down and remains active, the user can travel further on the transport network 23 or another transport network 23 without requiring any further action on the part of the user. In this embodiment, an open ticket can remain active over an entire billing period, and is automatically closed down by the control center 35 at the end of the billing period through transmission of an open ticket termination signal to the mobile communicator 31. Where the mobile communicator 31 is still assigned to a journey, following receipt of a journey commencement confirmation signal and absent termination of the journey, at the end of the billing period, the billing period is extended until termination of the journey, this being when the access communicator 41 of

an access unit 39 at an access point 25a, 25b transmits a journey termination signal to the control center 35.

In this embodiment billing is performed at intervals, typically daily, such that all ticket charges incurred during the interval are totalled and billed. In an alternative embodiment billing can be done on completion of each journey. One advantage of billing at intervals is that the journeys undertaken in the interval can be analyzed such as to allow for billing to take advantage of reduced fares, for example, where arising as a result of completing a return journey, as compared to two single journeys, or, where billed daily, on a day rover ticket where ones or all of the journeys are encompassed by such a ticket. With this billing arrangement, the user is provided with a clear incentive to utilize the ticketing system, as the user can be confident that the travel charges will be minimized retrospectively where possible, which could not be achieved by the current practice of purchasing tickets in advance of travel.

Where the user is transferring onto another leg of a journey, perhaps with a different transport provider, the user does not have to take any further action, as the existing open ticket will remain active.

In this embodiment the user can request journey information by selecting the "Journey History" option on his/her mobile communicator 31, which journey information includes the routes and costs.

In one embodiment the mobile communicators 31 are configured such that, when in the "Open Ticket" mode with an active open ticket, the mobile communicators 31 cannot be switched off while within the transport network 23, that is, following receipt of a journey commencement confirmation signal and absent termination of the journey.

As will be appreciated, from the perspective of the users, this ticketing system provides users with an extremely easy means of travelling on a

transport network 23 which requires a ticket to travel, as *inter alia* the users do not have to queue to obtain tickets.

As will also be appreciated, from the perspective of the transport providers, this ticketing system provides for much reduced ticketing overheads. Where a transport provider also issues advance-purchase tickets, and inspection of tickets is required, the open ticket provided by this ticketing system can be presented to a user.

In an alternative embodiment the mobile communicators 31 can be configured to display one of an entry code following receipt of a ticket request acknowledgement signal or an exit code following receipt of a journey billing signal, which codes can be checked at access units 39, either automatically by the provision of vision systems at the access units 39 or manually by a human operative.

In another embodiment the access units 39 could be non-gated, and provide for determination of a user entering or exiting an access point 25a, 25b. In this embodiment the access communicators 41 of the access units 39 merely determine the entry or exit of users through respective access units 39, and transmit a user entry signal or user exit signal to the control center 35 which confirms the access point 25a, 25b at which the user enters or exits the transport network 23. In one embodiment the time of entry and exit of each user is logged and referenced to the normal journey time for a journey between the determined access points 25a, 25b in order to identify fraudulent use of the ticketing system.

Figure 4 illustrates a ticketing system in accordance with a fourth embodiment of the present invention.

This ticketing system of this embodiment is substantially identical to the ticketing system of the above-described third embodiment, and thus, in order to avoid unnecessary duplication of description, only the differences will be described in detail.



This ticketing system of this embodiment differs from that of the third-described embodiment only in that the transport network 23 is a toll road network and the access units 39 comprise toll barriers. The ticketing system is otherwise identical and operation is the same, with users, each having a registered mobile communicator 31, arriving in vehicles at the toll barriers 39 for entry into or exit from the toll road network 23.

In one alternative embodiment, the mobile communicators 31, although assigned to users, typically businesses, could be fitted to respective vehicles.

In an alternative embodiment the access units 39 could be non-gated and provide for determination of a user entering or exiting an access point 25a, 25b. In this embodiment the access communicators 41 of the access units 39 merely determine the entry or exit of users through respective access units 39, and transmit a user entry signal or user exit signal to the control center 35 which confirms the access point 25a, 25b at which the user enters or exits the transport network 23. In one embodiment the time of entry and exit of each user is logged and referenced to the normal journey time for a journey between the determined access points 25a, 25b in order to identify fraudulent use of the ticketing system.

Figure 5 illustrates a ticketing system in accordance with a fifth embodiment of the present invention.

The ticketing system comprises a transport network 43, in this embodiment a bus network, which comprises a plurality of access points 45a, 45b, in this embodiment bus stops, at which the transport network 43 can be accessed to allow users to enter or exit the transport network 43, and transporters 49, in this embodiment buses, which provide for transport of users between ones of the access points 45a, 45b, a plurality of mobile communicators 51 which are assigned to registered users of the ticketing system, and a control

center 55 for authenticating registered mobile communicators 51 when enabled to the ticketing system, and billing for transport provided.

The transporters 49 each include an access unit 59, in this embodiment an access gate, for providing access to or from the respective transporter 49. In this embodiment the access units 59 each include an access communicator 61 for communicating locally with mobile communicators 51 of registered users when located thereat and the control center 55, as will be described in more detail hereinbelow.

In this embodiment the access units 59 are configured such as to allow a user to enter or leave the transporter only when his/her mobile communicator 51 is transmitting an access signal, as will be described in more detail hereinbelow.

The mobile communicators 51, in this embodiment mobile telephones, comprise a first transmitter/receiver unit for locally communicating with an access communicator 61 of an access unit 59 when the user passes therethrough, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 55. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 43.

The mobile communicators 51 provide for determination of the position thereof, in this embodiment by one of satellite positioning, such as GPS, radio positioning, such as triangulation, or cell identification. In this embodiment the control center 55 periodically logs the position of enabled mobile communicators 51 such as to allow for subsequent review should any dispute arise concerning the journey made by a user.

The mobile communicators 51 are each registered to a user, with the details held for each registered user including the name, address, security

information, such as a memorable address or date, bank details to allow for direct debiting or crediting of charges, personal preferences, and demographic details.

In this embodiment each mobile communicator 51 is activated for use on the ticketing system by use of an authentication mechanism, such as by inputting an operating code, for example, a personal identification (PIN) code.

The access communicators 61 at the access units 59 each include a first transmitter/receiver unit for locally communicating with the mobile communicators 51 of any registered user when passing through the respective access unit 59, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 55. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 43.

In this embodiment the mobile communicators 51 and the access communicators 61 of the access units 59 are configured to communicate with the control center 55 over the same mobile communications network, though different mobile communications networks could be utilized.

When requiring to travel, a user enables his/her mobile communicator 51 by entering his/her operating code, and obtains an open ticket by selecting the "Open Ticket - Configure" option on his/her mobile communicator 51. On selecting this option, the mobile communicator 51 transmits a ticket request signal to the control center 55. On receiving a ticket request signal, the control center 55 authenticates the user, opens a ticket log, and transmits a ticket request acknowledgement signal to the mobile communicator 51 to confirm the establishment of a ticket log.

Having obtained an open ticket, and following receipt of a ticket request acknowledgement signal, the mobile communicator 51 locally transmits an access signal, allowing the user to pass through an access unit 59 of a transporter 49 at an access point 45a, and thus board the transporter 49. On passing through the access unit 59, the access communicator 61 of the access unit 59 receives the access signal and, in response to receipt of the access signal, opens the access unit 59 to allow the user to board the transporter 49.

Following opening of the access unit 59, the access communicator 61 of the access unit 59 transmits a journey commencement signal to the control center 55, which journey commencement signal includes transport information required for the purposes of ticketing. On receiving a journey commencement signal, the control center 55 updates the ticket log and transmits a journey commencement acknowledgement signal to the mobile communicator 51 to confirm the commencement of the journey, with the starting point of the journey, as dictated by the location of the access point 45a, being determined from the location of the mobile communicator 51 or the access communicator 61.

In an alternative embodiment the access communicator 61 of the access unit 59 could transmit a transporter entry signal to the mobile communicator 51, and, following receipt of the transporter entry signal, the mobile communicator 51 could transmit the journey commencement signal to the control center 55, with the starting point of the journey, as dictated by the location of the access point 45a, being determined from the location of the mobile communicator 51.

When the user wishes to alight from the transporter 49 at another access point 45b in the transport network 43, the user approaches the access unit 59 of the transporter 49. On passing through the access unit 59 to exit the transporter 49, the access communicator 61 of the access unit 59 receives the access signal and, in response to receipt of the access signal, transmits a journey termination signal to the control center 55, with the termination

point of the journey, as dictated by the location of the other access point 45b, being determined from the location of the access communicator 61.

On receiving the journey termination signal, the control center 55 closes the ticket log, determines the fare payable, and transmits a journey termination confirmation signal to the access communicator 61 of the access unit 59 to confirm termination of the journey. In this embodiment the journey termination confirmation signal includes the cost of the fare for the journey. Using the ticketing system, the fare structure can be sophisticated, as many factors, such as time of day, promotions, and user kind, for example, student or old-age pensioner (OAP) where entitled to discounts, can be taken into account without any burden on the part of the transport provider.

On receipt of the journey termination confirmation signal by the access communicator 61 of the access unit 59, the access unit 59 is opened and the access communicator 61 transmits a journey billing signal to the mobile communicator 51, which journey billing signal includes the cost of the fare for the journey, with the fare cost being presented to the user on his/her mobile communicator 51.

Following completion of the journey, the user can then manually close down the open ticket by selecting the "Open Ticket - Terminate" option on his/her mobile communicator 51. Where the open ticket is not closed down and remains active, the user can travel further on the transport network 43 or another transport network 43 without requiring any further action on the part of the user. In this embodiment, an open ticket can remain active over an entire billing period, and is automatically closed down by the control center 55 at the end of the billing period through transmission of an open ticket termination signal to the mobile communicator 51. Where the mobile communicator 51 is still assigned to a journey, following receipt of a journey commencement confirmation signal and absent termination of the journey, at the end of the billing period, the billing period is extended until termination of the journey, this being when the access communicator 61 of

the transporter 49 transmits a journey termination signal to the control center 55.

In this embodiment billing is performed at intervals, typically daily, such that all ticket charges incurred during the interval are totalled and billed. In an alternative embodiment billing can be done on completion of each journey. One advantage of billing at intervals is that the journeys undertaken in the interval can be analyzed such as to allow for billing to take advantage of reduced fares, for example, where arising as a result of completing a return journey, as compared to two single journeys, or, where billed daily, on a day rover ticket where ones or all of the journeys are encompassed by such a ticket. With this billing arrangement, the user is provided with a clear incentive to utilize the ticketing system, as the user can be confident that the travel charges will be minimized retrospectively where possible, which could not be achieved by the current practice of purchasing tickets in advance of travel.

Where the user is transferring onto another leg of a journey, perhaps with a different transport provider, the user does not have to take any further action, as the existing open ticket will remain active.

In this embodiment the user can request journey information by selecting the "Journey History" option on his/her mobile communicator 51, which journey information includes the routes and costs.

In one embodiment the mobile communicators 51 are configured such that, when in the "Open Ticket" mode with an active open ticket, the mobile communicators 51 cannot be switched off while within the transport network 43, that is, following receipt of a journey commencement confirmation signal and absent termination of the journey.

As will be appreciated, from the perspective of the users, this ticketing system provides users with an extremely easy means of travelling on a

transport network 43 which requires a ticket to travel, as *inter alia* the users do not have to purchase tickets, which may require exact change.

As will also be appreciated, from the perspective of the transport providers, this ticketing system provides for much reduced ticketing overheads. Where a transport provider also issues advance-purchase tickets, and inspection of tickets is required, the open ticket provided by this ticketing system can be presented to a user.

In an alternative embodiment the mobile communicators 51 can be configured to display one of an entry code following receipt of a ticket request acknowledgement signal or an exit code following receipt of a journey billing signal, which codes can be checked at access units 59, either automatically by the provision of vision systems at the access units 59 or manually by a human operative.

In an alternative embodiment the access units 59 could be non-gated and provide for determination of a user entering or exiting an access point 45a, 45b. In this embodiment the access communicators 61 of the access units 59 merely determine the entry or exit of users through respective access units 59, and transmit a user entry signal or user exit signal to the control center 55 which confirms the access point 45a, 45b at which the user enters or exits the transport network 43. In one embodiment the time of entry and exit of each user is logged and referenced to the normal journey time for a journey between the determined access points 45a, 45b in order to identify fraudulent use of the ticketing system.

Figure 6 illustrates a ticketing system in accordance with a sixth embodiment of the present invention.

The ticketing system comprises a transport network 63, in this embodiment a railway network, here an overground railway network, which comprises a plurality of access points 65a, 65b, in this embodiment stations, at which the transport network 63 can be accessed to allow users to enter or exit the

transport network 63, and transporters 69, in this embodiment trains, which provide for transport of users between ones of the access points 65a, 65b, a plurality of mobile communicators 71 which are assigned to registered users of the ticketing system, and a control center 75 for authenticating registered mobile communicators 71 when enabled to the ticketing system, and billing for transport provided.

The access points 65a, 65b of the transport network 63 include access units 79, in this embodiment access gates, for providing access to or from the access points 65a, 65b. In this embodiment the access units 79 each include an access communicator 81 for communicating locally with mobile communicators 71 of registered users when located thereat and the control center 75, as will be described in more detail hereinbelow.

In this embodiment the access units 79 are configured such as to allow a user to enter or leave an access point 65a, 65b only when his/her mobile communicator 71 is transmitting an access signal, as will be described in more detail hereinbelow.

The mobile communicators 71, in this embodiment mobile telephones, comprise a first transmitter/receiver unit for locally communicating with an access communicator 81 of an access unit 79 when the user passes therethrough, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 75. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 63.

The mobile communicators 71 provide for determination of the position thereof, in this embodiment by one of satellite positioning, such as GPS, radio positioning, such as triangulation, or cell identification. In this embodiment the control center 75 periodically logs the position of enabled



mobile communicators 71 such as to allow for subsequent review should any dispute arise concerning the journey made by a user.

The mobile communicators 71 are each registered to a user, with the details held for each registered user including the name, address, security information, such as a memorable address or date, bank details to allow for direct debiting or crediting of charges, personal preferences, and demographic details.

In this embodiment each mobile communicator 71 is activated for use on the ticketing system by use of an authentication mechanism, such as by inputting an operating code, for example, a personal identification (PIN) code.

The access communicators 81 at the access units 79 each include a first transmitter/receiver unit for locally communicating with the mobile communicators 71 of any registered user when passing through the respective access unit 79, and a second transmitter/receiver unit for communicating, in this embodiment over a mobile communications network, typically a cellular mobile communications network, with the control center 75. In an alternative embodiment the mobile communications network could comprise a local wireless network, for example, a WiFi network, which provides for communication over the transport network 63.

In this embodiment the mobile communicators 71 and the access communicators 81 of the access units 79 are configured to communicate with the control center 75 over the same mobile communications network, though different mobile communications networks could be utilized.

When requiring to travel, a user enables his/her mobile communicator 71 by entering his/her operating code, and obtains a closed ticket, that is, a ticket having fixed travel permissions, for example, for travel between two fixed access points 65a, 65b, or within a predetermined zone served by a plurality of access points 65a, 65b, by selecting the "Closed Ticket" option on his/her

mobile communicator 71 and the ticket kind information of the required ticket, for example, as defined by a fixed journey between two access points 65a, 65b or for multiple journeys within a travel zone, and having any required duration. On selecting this option, the mobile communicator 71 transmits a ticket request signal to the control center 75, which ticket request signal includes the ticket kind information. On receiving a ticket request signal, the control center 75 authenticates the user, debits the appropriate fare, and transmits a ticket confirmation signal to the mobile communicator 71, which ticket confirmation signal includes authentication of the purchase of a ticket and the ticket details.

On receiving a ticket confirmation signal, the mobile communicator 71 locally transmits an access signal, allowing the user to pass through an access unit 79 at an access point 65a, 65b. On passing through an access unit 79 to enter an access point 65a, 65b, in this embodiment one access point 65a, the access communicator 81 of the access unit 79 receives the access signal and, in response to receipt of the access signal valid for the access unit 79, opens the access unit 79 to allow the user to enter the access point 65a.

Following opening of the access unit 79, the access communicator 81 of the access unit 79 transmits a journey commencement signal to the control center 75. On receiving a journey commencement signal, the control center 75 maintains a ticket log, with the starting point of the journey being the access point 65a.

Following travel on the transporter 69 to a destination access point 65b in the transport network 63 where the user wishes to leave the transport network 63, the user approaches an access unit 79 at the other access point 65b. On passing through the access unit 79 to exit the other access point 65b, the access communicator 81 of the access unit 79 receives the access signal and, in response to receipt of a valid access signal, opens the access unit 79, and transmits a journey termination signal to the mobile

communicator 71, which journey termination signal includes a designation of the access point 65b.

On receiving the journey termination signal, the mobile communicator 71 invalidates the fixed ticket insofar as the journey encompassed by the fixed ticket has been completed, typically of a single or return journey between fixed access points 65a, 65b.

As will be appreciated, from the perspective of the users, this ticketing system provides users with an extremely easy means of travelling on a transport network 63 which requires a ticket to travel, as *inter alia* the users do not have to queue to obtain tickets.

As will also be appreciated, from the perspective of the transport providers, this ticketing system provides for much reduced ticketing overheads. Where a transport provider also issues advance-purchase tickets, and inspection of tickets is required, the fixed ticket provided by this ticketing system can be presented to an inspector.

In an alternative embodiment the mobile communicators 71 can be configured to display one of an entry code following receipt of a ticket confirmation signal or an exit code following receipt of a journey termination signal, which codes can be checked at access units 79, either automatically by the provision of vision systems at the access units 79 or manually by a human operative.

In an alternative embodiment the access units 79 could be non-gated and provide for determination of a user entering or exiting an access point 65a, 65b. In this embodiment the access communicators 81 of the access units 79 merely determine the entry or exit of users through respective access units 79, and transmit a user entry signal or user exit signal to the control center 75 which confirms the access point 65a, 65b at which the user enters or exits the transport network 63. In one embodiment the time of entry and exit of each user is logged and referenced to the normal journey time for a

journey between the determined access points 65a, 65b in order to identify fraudulent use of the ticketing system.

In one embodiment an access code can be provided to a user to allow for manual operation of an access unit 79.

In another alternative embodiment the access units 79 could be omitted.

Finally, it will be understood that the present invention has been described in its preferred embodiments and can be modified in many different ways without departing from the scope of the invention as defined by the appended claims.

In preferred embodiments the ticketing system can handle the billing of season tickets in a flexible way. Where a user regularly buys tickets through the ticketing system for a journey that has season ticket rates, typically, weekly, monthly and annual season ticket rates, then, at points in time, the cost of purchasing individual tickets would become more expensive than the cost of the respective season tickets.

In one mode, the ticketing system of the present invention allows money to be taken for each daily ticket up to and until the weekly season ticket rate had been exceeded. Future travel during that week on that journey would then be free and any difference between the total paid on daily tickets and the weekly season ticket could be refunded. This would then be repeated for further weeks until the monthly rate had been exceeded. Future travel during that month on that journey would then be free and any difference between the total paid on weekly tickets and the monthly season ticket could be refunded. This would then be repeated for further months until the annual rate had been exceeded. Future travel during that year on that journey would then be free and any difference between the total paid on monthly tickets and the annual season ticket could be refunded.

Another mechanism, that is simpler to understand, technically easier to deliver and may be more attractive to the transport operator is one when the ticket is always charged at the daily rate, but details are logged. When a week has passed the journeys undertaken are compared with the appropriate weekly season ticket and if the money taken exceeds the weekly charge the difference is refunded. The same happens after a month when fees paid to that date are compared with the monthly fare, if there is an excess this is refunded; and similarly again after one year.

The operators should like this system because they have use of the excess funds until it has to be repaid as excess takings. The user may like this system since it is easy to understand, and avoids the need to pay up front the full cost of a season ticket or make a decision as to whether it is necessary. In addition it encourages use, since users are aware that later in the week, month or year the cost of their travel may be zero if they manage to reach a certain level of use. Note, however that the operator still gets his daily take (at least temporarily) even on zero cost fares. This take may not need to be paid back to the user for a number of months.

**CLAIMS**

1. A ticketing system, comprising:  
a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel;  
at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of transporters which provide for transport of users between access points and each include an on-board transport communicator for communicating locally with any enabled mobile communicators of registered users on board the respective transporter; and  
a control center for logging travel of users on the at least one transport network through communication established between enabled mobile communicators and the transport communicators of transporters.
2. The system of claim 1, wherein the control center is configured to determine the access points at which a user enters and exits the at least one transport network from a location of the mobile communicator registered to the user.
3. The system of claim 1 or 2, wherein at least ones of the access points include at least one access unit for determining access to the respective access point, and each access unit includes an access communicator for communicating locally with an enabled mobile communicator when located thereat to determine access through the respective access unit.
4. The system of claim 3, wherein the control center is configured to determine the access points at which a user enters and exits the at least one transport network from a location of the access units through which the user enters and exits the at least one transport network.

5. The system of any of claims 1 to 4, wherein the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.
6. The system of any of claims 3 to 5, wherein the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.
7. The system of any of claims 1 to 6, wherein the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.
8. The system of claim 7, wherein the open ticket is valid for a predetermined period.
9. The system of any of claims 1 to 6, wherein the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.
10. A ticketing system, comprising:
  - a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel; and
  - at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of transporters which provide for transport of users between access points, wherein at least ones of the access points include at least one access unit for determining access to the respective access point, and each access unit includes an access communicator for communicating locally with an enabled mobile communicator when located thereat to determine access through the respective access unit.

11. The system of claim 10, further comprising:  
a control center for logging travel of users on the at least one transport network through communication between enabled mobile communicators and the access communicators of access units.
12. The system of claim 10 or 11, wherein the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.
13. The system of any of claims 10 to 12, wherein the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.
14. The system of any of claims 10 to 13, wherein the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.
15. The system of claim 14, wherein the open ticket is valid for a predetermined period.
16. The system of any of claims 10 to 13, wherein the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.
17. The system of any of claims 10 to 16, wherein the access units comprise access gates for controlling access to the respective access points, and the access communicators are configured to communicate locally with enabled mobile communicators when located thereat to allow access through the respective access units.
18. A ticketing system, comprising:



a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel; and

at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, and a plurality of transporters which provide for transport of users between access points, wherein the transporters each include at least one access unit for determining access at the respective access point, and each access unit includes an access communicator for communicating locally with an enabled mobile communicator when located thereat to determine access through the respective access unit.

19. The system of claim 18, further comprising:  
a control center for logging travel of users on the at least one transport network through communication between enabled mobile communicators and the access communicators of access units.
20. The system of claim 18 or 19, wherein the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.
21. The system of any of claims 18 to 20, wherein the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.
22. The system of any of claims 18 to 21, wherein the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.
23. The system of claim 22, wherein the open ticket is valid for a predetermined period.

24. The system of any of claims 18 to 23, wherein the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.
25. The system of any of claims 18 to 24, wherein the access units are configured to control access, and the access communicators are configured to communicate locally with enabled mobile communicators when located thereat to allow access through the respective access units.
26. A ticketing system, comprising:
  - a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel;
  - at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network, wherein the access points include at least one access unit for determining access to the respective access point, and each access unit includes an access communicator for communicating locally with an enabled mobile communicator when located thereat to determine access through the respective access unit; and
  - a control center for logging travel of users on the at least one transport network through communication between enabled mobile communicators and the access communicators of access units.
27. The system of claim 26, wherein the ticket is an open ticket which allows the user to travel freely on the at least one transport network, with the control center logging travel by the user.
28. The system of claim 27, wherein the open ticket is valid for a predetermined period.

29. The system of claim 26, wherein the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.
30. The system of any of claims 26 to 29, wherein the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.
31. The system of any of claims 26 to 30, wherein the access units comprise access gates, and the ticket provides an access code for manually accessing an access unit.
32. The system of any of claims 26 to 31, wherein the access units are configured to control access, and the access communicators are configured to communicate locally with enabled mobile communicators when located thereat to allow access through the respective access units.
33. A ticketing system, comprising:
  - a plurality of mobile communicators, each registered to a user of the ticketing system and being operable to obtain a ticket to enable travel on at least one transport network; and
  - a control center in operative communication with the mobile communicators in enabling a user to obtain a ticket through a request made at a mobile communicator registered thereto.
34. The system of claim 33, further comprising:
  - at least one transport network comprising a plurality of access points at which the at least one transport network can be accessed to allow users to enter or exit the at least one transport network.
35. The system of claim 34, wherein at least ones of the access points include at least one access gate, and the ticket provides an access code for manually accessing an access unit.

36. The system of claim 34 or 35, wherein the ticket is a closed ticket, providing for travel between predetermined access points or within a predetermined zone.
37. The system of any of claims 33 to 36, wherein the ticket includes an image, including one or both of text and graphic elements, to allow presentation to a human inspector.
38. A method of billing users for tickets, comprising the step of billing each daily ticket up to and until a season ticket rate for a predeterminable period is exceeded, and providing free travel thereafter during that period.
39. The method of claim 38, wherein the season ticket rate is that for one journey route.
40. The method of claim 38 or 39, wherein the period is one of a week, month or year.
41. The method of claim 38 or 39, further comprising the step of billing each daily ticket up to and until a season ticket rate for a further predeterminable period is exceeded, and providing free travel thereafter during that further period.
42. The method of claim 41, wherein the first period is a week, and the further period is one of a month or a year.
43. The method of claim 41 or 42, further comprising the step of billing each daily ticket up to and until a season ticket rate for a yet further predeterminable period is exceeded, and providing free travel thereafter during that yet further period.

44. The method of claim 43, wherein the first period is a week, the further period is one of a month, and the yet further period is of a year.
45. A method of billing users for tickets, comprising the step of billing each daily ticket for a predeterminable period, and, where the bill exceeds a season ticket rate for the period, subsequently making a refund.
46. The method of claim 45, wherein the season ticket rate is that for one journey route.
47. The method of claim 45 or 46, wherein the period is one of a week, month or year.
48. A method of billing users for tickets, comprising the steps of, for any user, billing for provided tickets at a current rate, logging a ticket billing history for the billed tickets, and reviewing the ticket billing history to determine if ones of the provided tickets could have been billed at a lower rate by providing one or more alternative tickets, and refunding a difference in the rates of the ones of the provided tickets and the one or more alternative tickets.
49. A method of billing users for tickets, comprising the steps of, for any user, billing for provided tickets at a current rate, logging a ticket billing history for the billed tickets, and reviewing the ticket billing history to determine if, for any journey route, ones of the provided tickets would be encompassed by a season ticket of lower rate, and, where a season ticket of lower rate is determined, providing free future travel for a duration of that season ticket on the journey route.

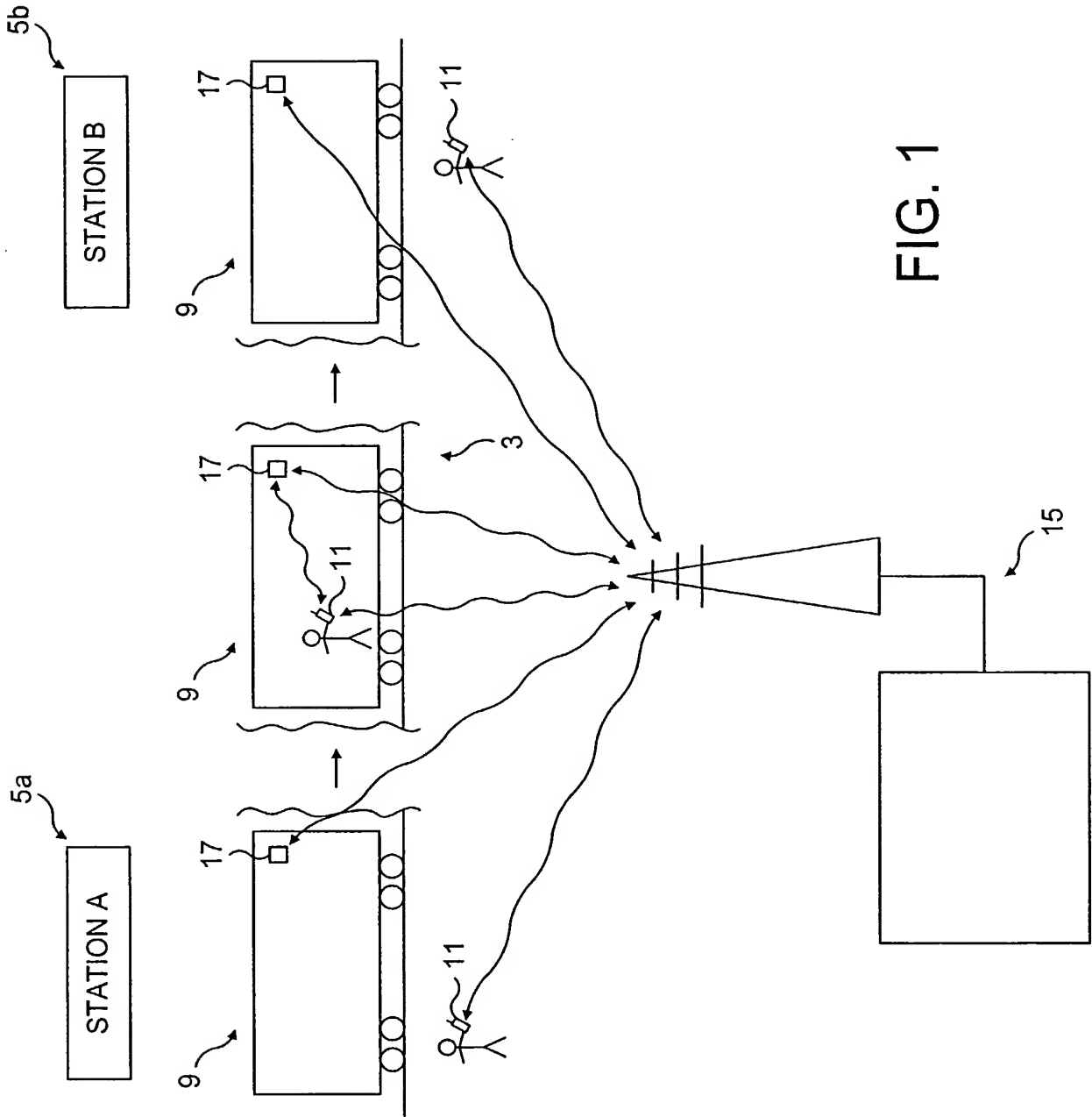
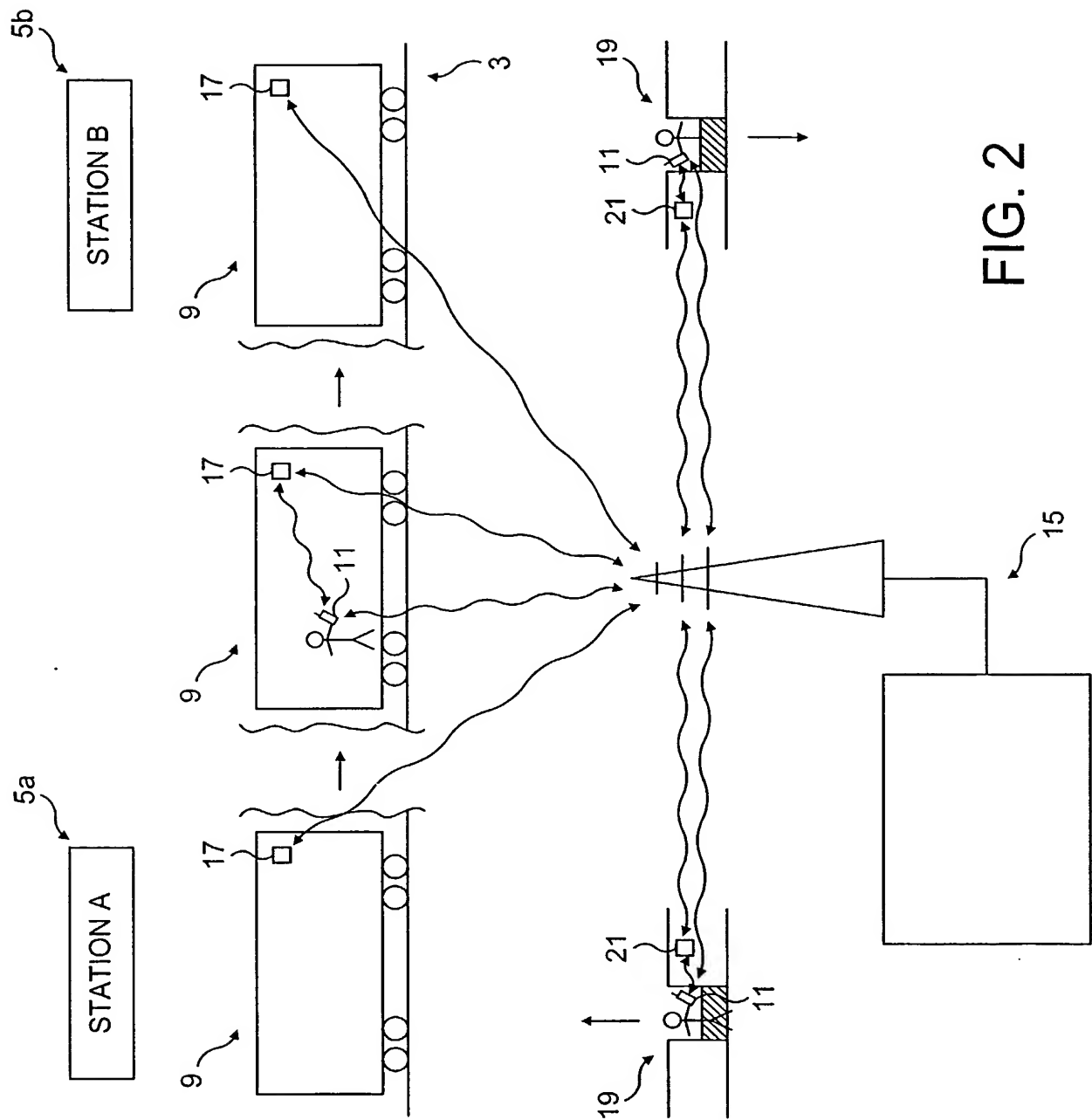


FIG. 1



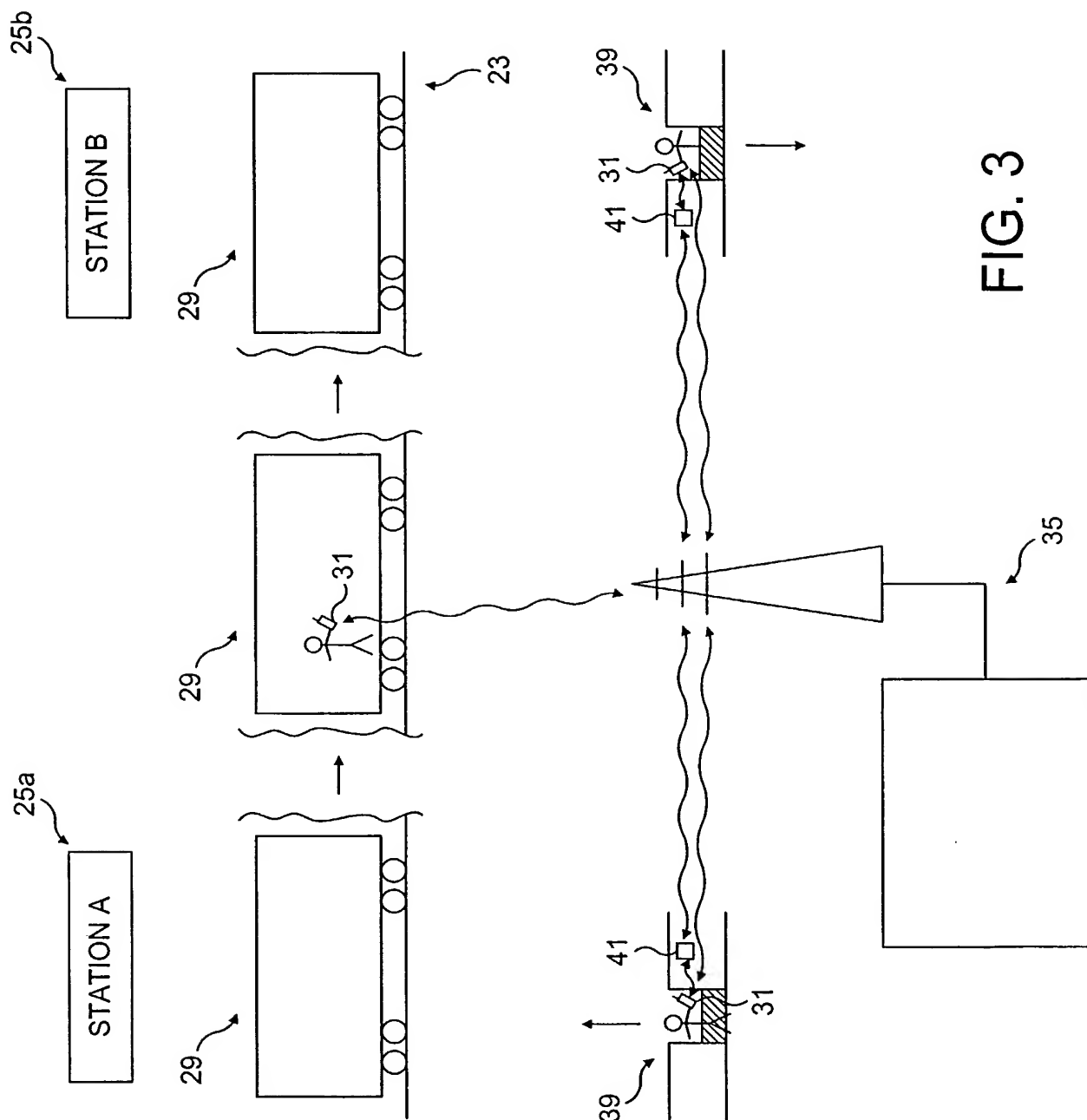
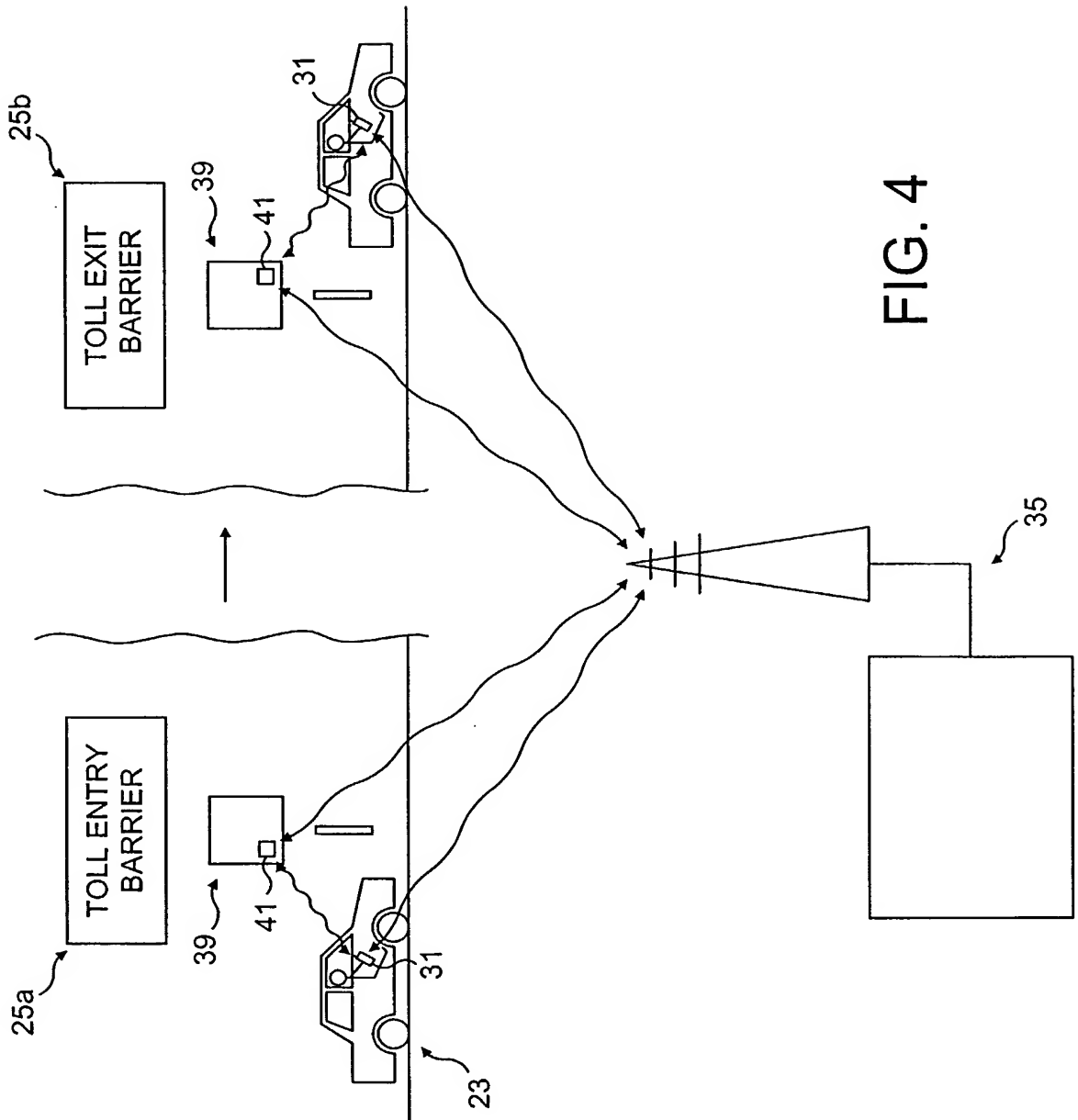


FIG. 3





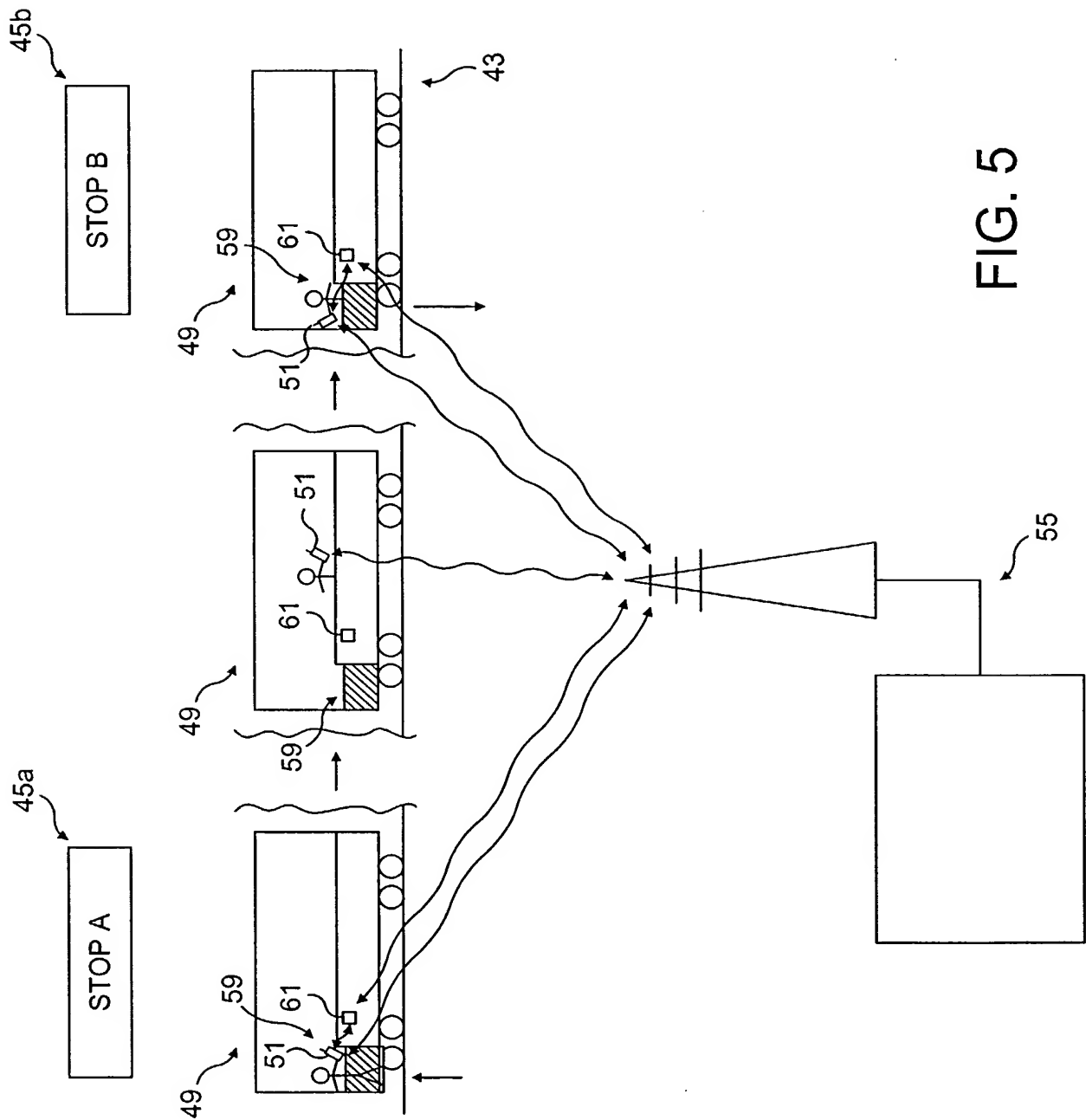


FIG. 5

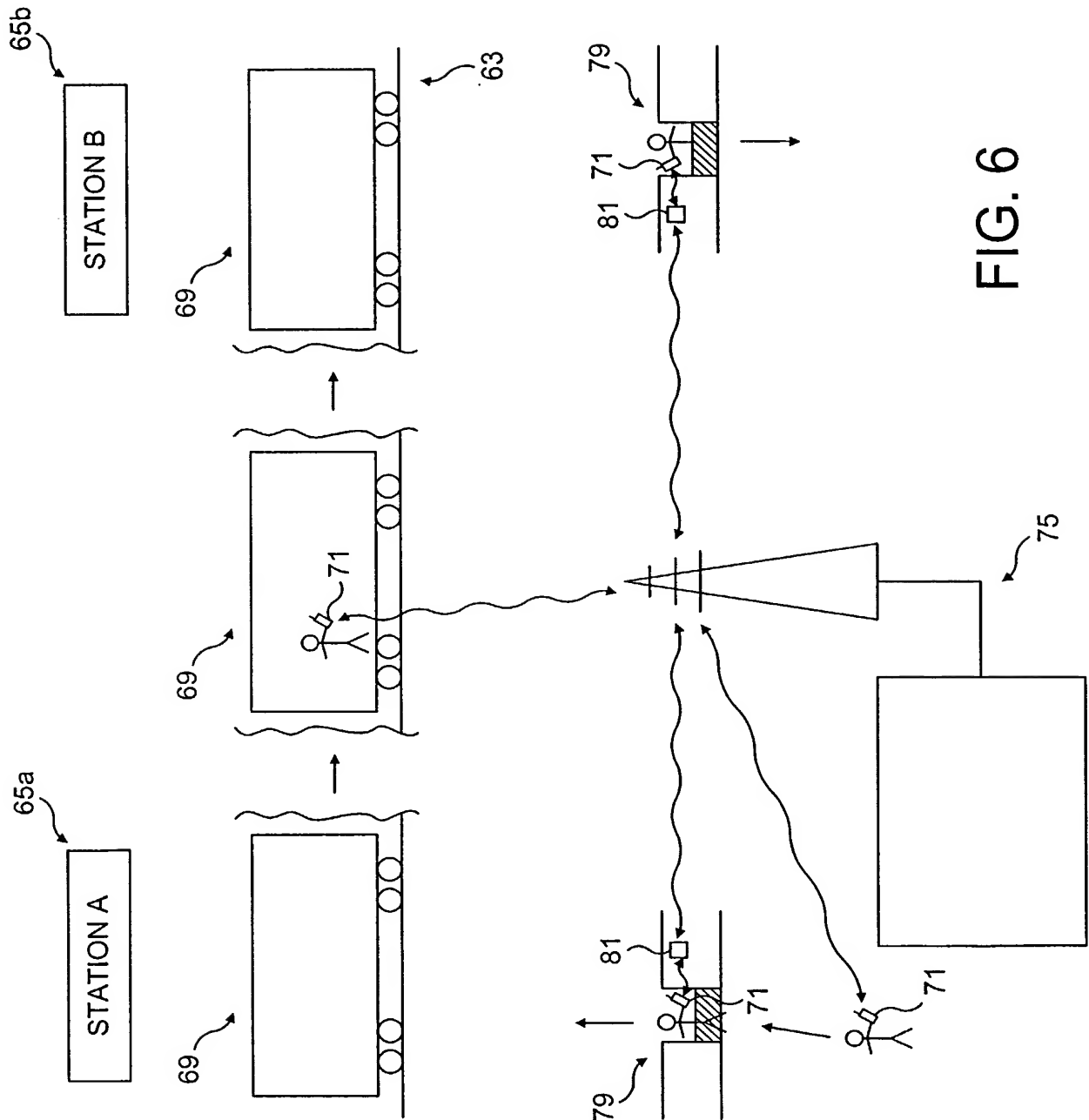


FIG. 6